

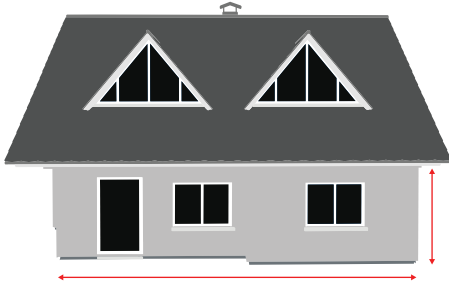


Standard Stone Installation Guide

For installation guidelines on Coronado Stone Products' Classic Series, WoodStone and Industrial Ledge please visit - <https://www.coronado.com/InstallationGuides>



Follow the steps below to determine the total estimated amount of stone veneer flats (sqft) and corners (lnft) needed for a project.



Step-1: Determining (Rectangular) Surface Area:

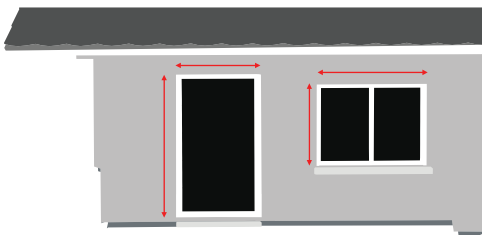
Multiply the length (in feet) by the height (in feet) of each surface area that will be covered with Coronado Stone Veneer.



Step-2: Determining (Triangular) Surface Area:

To calculate the square footage of an isosceles triangle: Multiply the length (in feet) by the center height (in feet) then divide by 2.

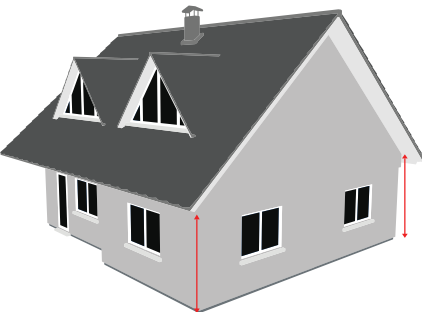
After you've completed Step-1 and Step-2, add the calculated square footage numbers together from all wall surfaces.



Step-3: Adjusting Square Footage to Accommodate Windows and Doors:

Calculate the individual square footage for each window and door. Then combine the calculated square footage together.

Note: (Step-1 + Step-2) - (Step-3) x (1.2 for overlap) = Square footage of metal lath needed for your project.



Step-4: Measuring Linear Footage for Corners:

Measure the linear footage of all outside corners, plus any doorways or windows that will be requiring stone veneer corners. Add the measurements together, this will give you the total linear footage of corners needed for your project.

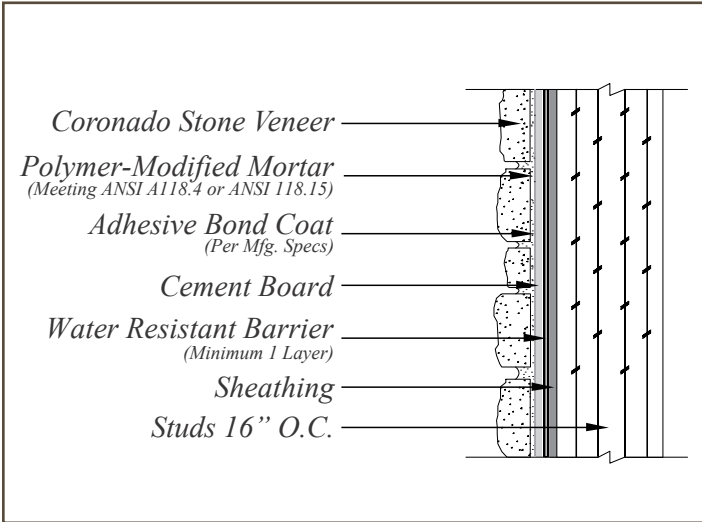
Step-5: Calculating the Final Square Footage of Flats Needed:

Take the combined total square footage of Step-1 and Step-2 and subtract the square footage calculated in Step-3. Then you'll need to subtract the estimated square footage that will be consumed by the stone veneer corners. On average, one linear foot of stone veneer corners consumes approximately 3/4 square foot of wall coverage (smaller profiles typically consume less coverage, while larger profiles may consume more coverage). Take this into account when calculating your final quantities. Coronado Stone also suggests ordering 5-10 percent extra stone to compensate for loss due to cutting and trimming during the installation process.

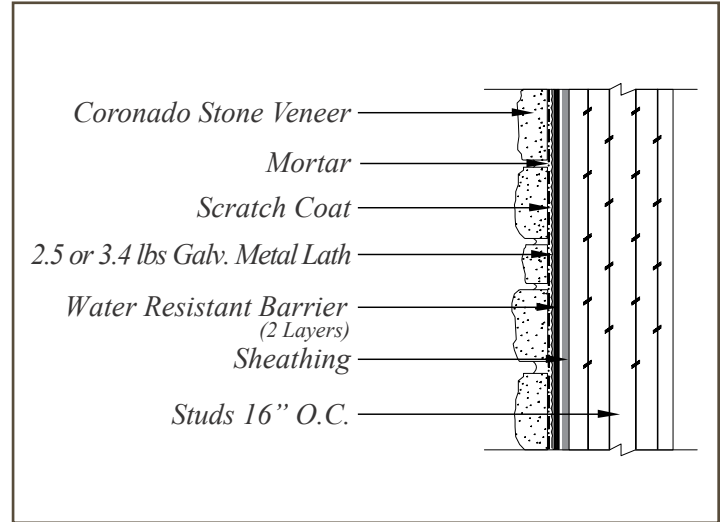
Example: $(\text{Step-1} + \text{Step-2}) - (\text{Step-3}) - (\text{Step-4} \times .75) \times (\text{suggested } 10\% \text{ extra}) = \text{Total}$
 $800\text{sqft} - 120\text{sqft} = 680\text{sqft} - 60\text{sqft} = 620\text{sqft} \times 1.10 = 682\text{sqft}$

Note: Grouted stone profiles are packaged assuming a 1/2" grout joint. If you intend on using a different sized grout joint, it may be necessary to adjust your quantities accordingly.

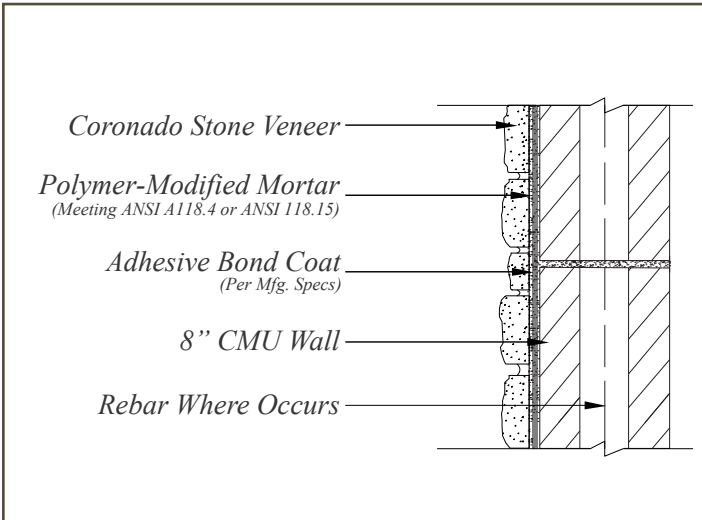
Wood Frame with Cement Board



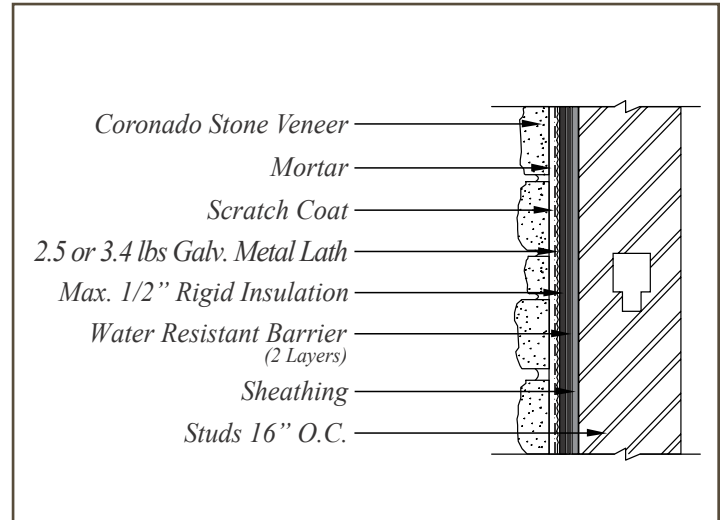
Wood Frame with Sheathing



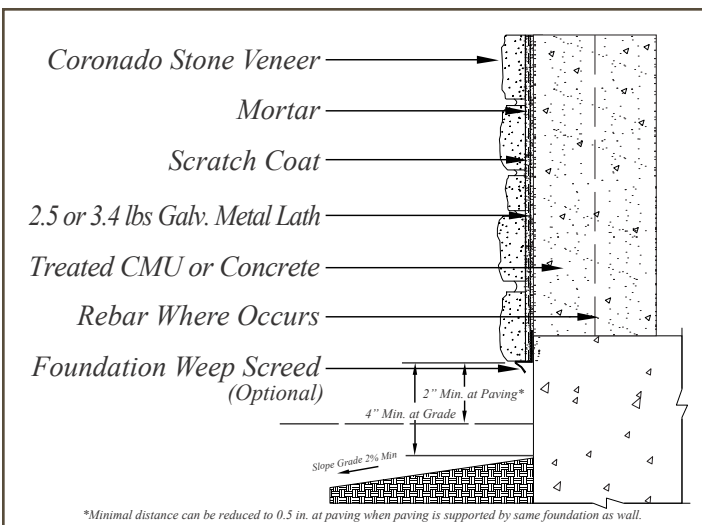
Untreated / Unpainted Clean CMU



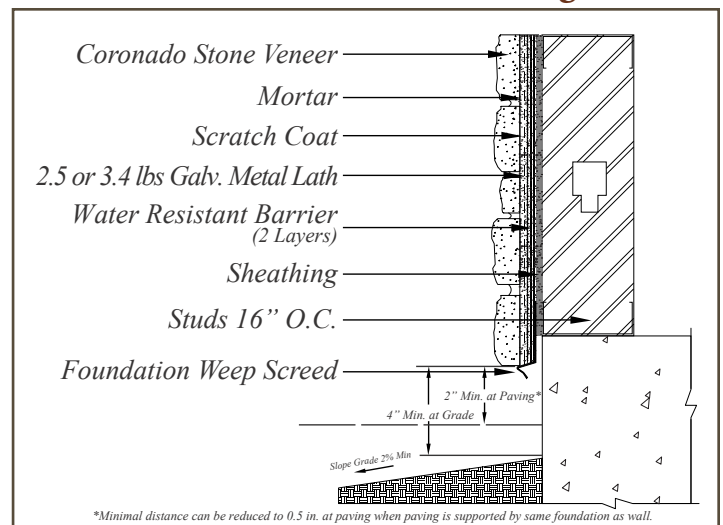
Steel Frame with Rigid Insulation



Treated / Painted Concrete



Steel Frame with Sheathing



For Additional Details Please Visit - <https://www.coronado.com/TechnicalDrawings>
 All Dry-Stacked applications require Polymer-Modified Mortar
 Drawings Not To Scale

Wall System Substrate	Required Surface Preparation			
	WRB	Lath	Scratch Coat	Notes
Plywood	2 Layers	✓	✓	
OSB	2 Layers	✓	✓	
Wallboard	2 Layers	✓	✓	
Exterior Gypsum	2 Layers	✓	✓	
Fiber Board	2 Layers	✓	✓	
1/2" Rigid Insulation	2 Layers ¹	✓	✓	
Metal Building	2 Layers	✓	✓	
Stucco	2 Layers	✓	✓	
Cement Board (Exterior Application)	Minimum 1 Layer	Optional	Bond coat required for installs without lath.	Requires a polymer-modified mortar for installs without lath.
CMU	Optional for clean unpainted or untreated surfaces. ²	Optional for clean unpainted or untreated surfaces. ²	Bond coat required for installs without WRB and lath.	Lath must be used on surfaces that have been painted, treated or that have a questionable bond. Bondable surfaces require a polymer-modified mortar for installs without WRB and lath. ²
Poured Concrete or Tilt Up ³	Optional for clean unpainted or untreated surfaces. ²	Optional for clean unpainted or untreated surfaces. ²	Bond coat required for installs without WRB and lath.	Lath must be used on surfaces that have been painted, treated or that have a questionable bond. Bondable surfaces require a polymer-modified mortar for installs without WRB and lath. ²
Brick Masonry	Optional	✓	✓	
Rigid Insulation Thicker Than 1/2"	2 Layers ¹	✓	✓	For applications over rigid insulation thicker than 1/2", please contact Coronado Stone for installation and fastener recommendations.
Cement Board (Interior Application)	Optional	Optional	Bond coat required for installs without lath.	Requires a polymer-modified mortar for installs without lath.
Interior Application (Non-moisture Sensitive Substrate)	Optional ⁴	✓	✓	WRB is optional for interior non-moisture sensitive areas. A Single layer of WRB is recommended for moisture sensitive sheathing/substrates. ⁴

¹ Some rigid foam insulation products qualify as a layer of WRB. Check with foam manufacturer to confirm.
² Bonding tests should be performed on every surface before installation to assess adhesion and confirm proper bonding strength.
³ Tilt-up and pour in place concrete walls may have to be sandblasted and cleaned of all residue / bond inhibitors to achieve a proper adhesion.
⁴ Refer to corresponding exterior wall detailing requirements for interior applications exposed to moisture.



Italian Villa® - Volterra

Building Codes:

Check with your local building authorities to ensure that your project complies with all state and local building codes. If there is discrepancy between building codes and the installation guidelines contact Coronado Stone Products.

Required Tools:

- **OSHA Approved Safety Glasses and Dust Mask** (Safety Equipment)
- **Hammer or Screw Gun or Air-Powered Nail Gun** (Installing Lath)
- **Fasteners** (Installing Lath)
- **Wheelbarrow and Hoe or 5 Gallon Bucket and Drill with Mixing Paddle** (Mixing Mortar)
- **Mason's Trowel, Finishing Trowel and Margin Trowel** (Applying Mortar / Scratch Coat)
- **Masonry Scarifier or Masonry Rake** (Scratch Coat)
- **Tape Measure and Chalk Line** (Creating a Level Installation)
- **Stone Nippers or Grinder with Diamond Blade or Wet Saw with Diamond Blade** (Shaping Stone)
- **Grout Bag** (Grouting Joints)
- **Jointing Tool or Wood Stick** (Striking Grout Joints)
- **Whisk Broom and Sponge** (Cleaning Finished Work)
- **Level 48" min** (Maintaining Level and Flush Installation)

Step 1 - Install Water Resistant Barrier (WRB) (If Necessary)

For exterior applications where WRB is required, install two separate layers, using a product that complies with Grade D, ASTM E2556 or an approved equivalent. The outer layer of WRB provides separation between the scratch coat and the inner layer of WRB. The inner layer of WRB with any appropriate flashings creates a drainage plain within the wall system. Starting at the bottom of the wall, the WRB should be installed in a shingle fashion, overlapping each layer by a minimum of two inches. Vertical joints in the WRB should overlap a minimum of six inches, inside and outside corners of walls should be overlapped a minimum of 16 inches past the corner in both directions. Consult the WRB manufacturer's installation guidelines. If a rainscreen drainage plane system is required, consult the local jurisdiction requirements as they vary by region. WRB is optional for interior non-moisture sensitive areas, although a single layer of WRB is recommended for moisture sensitive sheathing/substrates. Refer to corresponding exterior wall detailing requirements for interior applications exposed to moisture.

Step 2 - Install Galvanized Metal Lath (If Necessary)

Install a 2.5 or 3.4 lbs self-furring diamond metal lath that complies with ASTM C847. Starting at the bottom of the wall, the lath should be installed horizontally with the cups facing up to allow the lath to catch and hold the scratch coat. This will create a rough texture that can be felt when rubbing your hand down the face of the lath. Each piece should overlap a minimum of one inch on all horizontal and vertical seams. Vertical seams should be staggered and the lath should be wrapped around corners at least 12 inches. Galvanized fasteners should be used every six inches vertically and 16 inches horizontally to affix the lath to the substrate. Fasteners should be anchored into framing members.

Fasteners - Corrosion resistant fasteners are used to secure lath and flashing to wall systems. A variety of fasteners are available to use depending on the application. Refer to ASTM C1063 for specific fastener selection criteria.

Step 3 - Apply a Scratch Coat

Apply a nominal ½" thick layer of mortar onto the lath. The mortar should be applied with enough pressure and thickness to fully embed the lath. Ensure the lath is completely covered with mortar to allow for scoring of the surface. Once the mortar is thumb-print hard, scratch the surface horizontally with a notched trowel or scarifier to create a scratch coat.

Step 4 - Mortar Mixtures (Dry-stacked, Grouted, Concrete, Large Format Stones)

Grouted Applications - A **Type S mortar** meeting ASTM C270 or ASTM C1714 standards is recommended for adhering grouted stone applications. A standard **Type S mortar** should also be used to grout these types of installations. Pigment can be added to the grout mixture to create a grout joint that complements the stone color. A **polymer-modified mortar** meeting ANSI A118.4 or ANSI 118.15 is recommended for adhering grouted applications in freeze-thaw environments.

Dry-Stacked Applications – A **polymer-modified mortar** meeting ANSI A118.4 or ANSI 118.15 is required for adhering all dry-stacked applications. Pigment should be added to the **polymer-modified mortar**, creating a color that complements the stone color. This will allow any mortar that is visible after the installation to blend in seamlessly with the stone.

Step 4 - Mortar Mixtures (Continued)

Concrete / Concrete Masonry / Cement Board Applications - An approved **polymer-modified mortar** or **polymer-modified thin set** meeting ANSI 118.4 or ANSI 118.15 should be used to adhere manufactured stone to all concrete, concrete masonry or cement board applications that have been deemed acceptable for achieving a proper bond. Bonding tests should be performed on every surface before installation to assess adhesion and confirm proper bonding strength. Some cement boards may require lath for proper adhesion. Tilt-up and pour in place concrete walls may have to be sandblasted and cleaned of all residue to achieve a proper bond. Concrete and masonry walls must be free of dirt, oils, paint, release agents and any other substances that may inhibit proper adhesion. Lath will need to be installed for any concrete or masonry surfaces that have been treated, painted or those with a questionable bond. For clean concrete and masonry surfaces, a fresh bond coat should be applied and worked into the wall right before the stone is applied. For grouted applications, a non-polymer standard **Type S mortar** should be used to fill all grout joints.

Large Format Profile Applications – For large format profile applications, including English Rubble, Santa Barbara, and Viejo Ranch, a **polymer-modified mortar** meeting ANSI A118.4 or ANSI 118.15 is required for adhering these types of stones. For Classic Series, WoodStone and Industrial Ledge please visit the following link to view recommended installation instructions - <https://www.coronado.com/InstallationGuides>

Mixing of the Mortar - Follow the mortar manufacturer's recommendations when mixing and maintaining the mortar on the job site.



Eastern Mountain Ledge® - Carmel Mountain

Step 5 - Snap Chalk Lines

After the scratch coat cures and before the stone is applied, snap chalk lines across the wall to ensure a proper horizontal alignment of the stone. The chalk lines are necessary in keeping the courses of stone straight and level during the installation process, which provides for a beautiful and professional result. (Not required for random shaped stones)

Step 6 - Moisten the Substrate and Back of Stone Veneer

A professional sprayer or sponge should be used to moisten the scratch coat and back of stone veneer during the entire installation process. This will help reduce the initial rate of water absorption. Both the veneer and scratch should be damp, but not excessively wet.

Step 7 - Mortar Coverage for Back of the Stone

With the flat-end of the trowel, work the mortar into the stone from multiple directions to break any surface tension and aid proper adhesion. Evenly distribute it until you have approximately a ½” thick layer of mortar across the entire back surface of the veneer. Push the stone firmly into place while wiggling the stone slightly to set the bond. You should push firmly enough so that the mortar is squeezed out around the edges of the stone. If sliding or slipping occurs during the application, you may have applied too much or not enough mortar to the back of the stone. Sliding or slipping stones should be removed and reapplied properly. Different types of mortars have varying consistencies. Follow the mortar manufacturer’s recommendations during the installation process.

Step 8 - Cutting and Shaping Manufactured Stone

Manufactured stone veneer is easily shaped or cut as desired. This enables you to fit stones quickly into place, insuring a natural looking wall with tight mortar joints. Cutting or shaping can be done by using any of the following tools: hand-held disc grinder with diamond blade, stone nippers or wet saw with diamond blade. When possible, cut edges should be hidden and/or covered by grout. Always wear OSHA approved safety glasses and dust masks during the cutting process. Wet saws and dust collector kits can also be used to keep dust to a minimum around job sites. Check for additional OSHA requirements in your area.

Step 9 - Installing the Stone Veneer

Layout approximately 25 pieces of stone in a visible and easy to access area. If you have multiple boxes, be sure to select an equal ratio of pieces from each box. This will ensure a consistent and blended final result. When installing the first course, start at the bottom corner of the wall installing 3 to 4 corner stones first. Corner pieces have a long and a short return, which should alternate in opposite directions as you work your way up the wall. Continue the project by installing flats off of these corner pieces. Work the stones into the wall with a side-to-side motion to create and ensure a proper bond. Each additional course that is installed will begin with a corner stone (when corners are present). Remember to use your chalk lines as a guide as the installation continues up the wall. If a stone is inadvertently moved or bumped after it has been set, it should be removed. Any additional mortar should be scraped off the stone and scratch coat, and then the stone should be reapplied following the installation process.



Shallow Brushed - Grey Grout



Full Brushed - White Grout

Step 10 - Grouting Techniques

The grout joint style and color can drastically change the overall look of a project. Joints can vary in depth, color and texture, so there are several different grouting techniques to choose from when designing a project. The grout joint style and color should be agreed upon and approved before the installation begins. Visit <https://www.coronado.com/GroutingOptions> to view different grouting styles.

Step 11 - Cleaning

If excess mortar drops or smears on to the face of the stone during application, it's best to remove the excess mortar and wipe the hazy area with a clean sponge as soon as possible. Be sure to clean or rotate the sponge during use, doing so will keep the transfer of mortar haze to other areas to a minimum. To remove dust and debris off the face of the stone veneer, use a dry whisk broom and lightly brush the surface. The stone veneer can also be cleaned with water and a soft bristle brush. Do not use chemical or acid washes, pressure washers, wire brushes or any other harsh methods of cleaning.

Step 12 - Water Repellents and Enhancers

Some customers like to utilize water repellents to help protect their stone against dirt build up, splashing water, sprinklers and de-icing materials. Only breathable, penetrating water-based silane water repellents should be used. The water repellent should be applied from the bottom-up following the manufacturer's specifications during all applications. Water repellents are not required but will help protect the stone against harsh weather. Some water repellents may darken or alter the appearance of a stone after being applied. There are also enhancers on the market that can help intensify the colors of your stone if needed. It is recommended that a test of all water repellents and enhancers be done in an inconspicuous area or on spare stones before applying it to your entire project. Remember to protect surrounding areas from overspray.

Removing Efflorescence

Efflorescence is a natural process caused by moisture transitioning through masonry to the exterior surface. This migrating moisture can cause salts and minerals to be deposited on the face of the masonry unit, creating a white filmy substance. Cleaning efflorescence can be done by lightly scrubbing the face of the stone with a soft bristle brush and water. In some cases, a 25% vinegar 75% water solution may need to be used. Do not use any harsh cleaning methods to remove efflorescence.

Salt and De-Icing Chemicals

Do not subject manufactured stone veneer to contact with de-icing materials, salt, or other harsh chemicals unless they are specifically designed for use with lightweight cement products (test products on a inconspicuous area before using them on the entire project). Prolonged exposure to these conditions may discolor the manufactured stone veneer or result in surface damage and may void the warranty.

Rainscreen

Rainscreens are optional building systems used to improve drainage behind cladding installations and can provide additional protection against trapped and excessive moisture. Some state and local building codes require rainscreens be installed behind manufactured stone applications. Follow the rainscreen manufacturer's installation recommendations.

Water Run-off or Cascading Water

It is not recommended to install manufactured stone veneer in areas of cascading water or below the water line. Water run-off should always be diverted away from installed manufactured stone veneer surfaces. Chemicals in the water may cause discoloration or efflorescence on the face of the stone. Sloped wall caps (with a minimum 1" overhang past the veneer face) should be used instead of flat veneer pieces to cap walls in areas that encounter heavy water run off. Moisture penetration can be avoided by utilizing proper design techniques and engineered systems.

Retaining Walls

Waterproofing and drainage systems should be incorporated into retaining walls directly where the soil meets the wall. If water intrusion is a potential problem, an optional rainscreen system can be installed behind the manufactured stone adhered to the retaining wall. Moisture resistant mortars can also be used to minimize water migration and efflorescence.

Movement and Expansion Joints

Local building codes may require movement or expansion joints to be incorporated into wall systems for specific projects. If a movement or expansion joint is incorporated into the wall, do not bridge that joint with the stone veneer, as this can result in a cracking of the stone. The stone should terminate at either side of the movement or expansion joint.

Extreme Cold Weather Applications

Coronado Stone Products have been installed in freeze/thaw climates for over 50 years. Installations should be performed in temperatures exceeding 40 degrees Fahrenheit to ensure proper mortar hydration to prevent bonding issues. In cold climates, masons should use heaters & tents during and following the installation process when temperatures are below 40 degrees Fahrenheit. In areas where snow will be in contact with manufactured stone veneer, a silane-based breathable sealer can be used to protect the stone from freeze-thaw damage. Polymer-modified mortars are recommended in extreme cold environments to aid adhesion strength.

Extreme Hot Weather Applications

If temperatures exceed 90 degrees Fahrenheit during the installation process, additional moisture will need to be added to the backs of the stone veneer and to the scratch coated surface. Shade and/or frequent misting of the wall and stone may be required. Extreme heat will extract moisture from the mortar, substrate, and stone which can prevent proper bonding. Polymer-modified mortars are recommended in extreme hot environments to aid adhesion strength.

Rigid Insulation Thicker than 1/2"

Please contact Coronado Stone for installation and fastener recommendations.

Installing to Grade

For exterior framed walls, base flashing and weep screeds should be installed a minimum of 4 inches above grade or a minimum of 2 inches above paved surfaces. The minimum distance can be reduced to ½ inch for paved walking surfaces supported by the same foundation that supports the wall. For concrete or masonry, maintain a minimum clearance of 2 inches above grade or ½ inch from a paved surface provided that frost heave or adjacent surfaces are taken into consideration.

Bond Coat

A Bond Coat is a thin layer of polymer-modified mortar or polymer-modified thin set mortar that is applied and worked directly into the substrate moments before the stone is installed. Applying the bond coat only to the area you are immediately installing over ensures that it will not dry prior to installation.

Scuffing

Scuffing occurs on both natural and manufactured stone veneers. Most of the time it enhances the natural beauty and look of a project. Most scuffing can be removed with the cleaning process described in Step 11.

Flashing / Weep Screeds / Casing Bead

Flashing must be installed at wall penetrations and terminations of the stone veneer. Assure that all flashing and kickouts are corrosion resistant, integrated with the WRB properly (when used), and installed in accordance with the local building code requirements.

Blending Boxes on Project Site

Product should be pulled from a variety of boxes and blended on site during installation to ensure a consistent overall project color on the wall.

On-site Material Storage

All manufactured stone stored on-site should be protected from the elements before and during the installation process. Material stored on-site should not be exposed to the elements for extended periods of time. Extended exposure can leave the product stained from job-site dirt and grime.

Warning

Cement stone veneers contain crystalline silica (quartz) and traces of other potentially hazardous substances which can be released into the air as dust and inhaled while dry-cutting, drilling or shaping the product. Crystalline silica and other materials contained in this product may cause cancer, birth defects and other reproductive harm. A properly fitted NIOSH approved particulate filtering face piece should be used during dust generating processes. Please consult Coronado's SDS for more information. Visit <https://www.coronado.com/TechnicalDocuments> for more information.

View our [Additional Tech Notes and Helpful Installation Tips](#) document for more information.



Appalachian Fieldstone - Mountain Sunset